

Understanding drivers' strategies for engaging with in-vehicle technology while driving: An interview study

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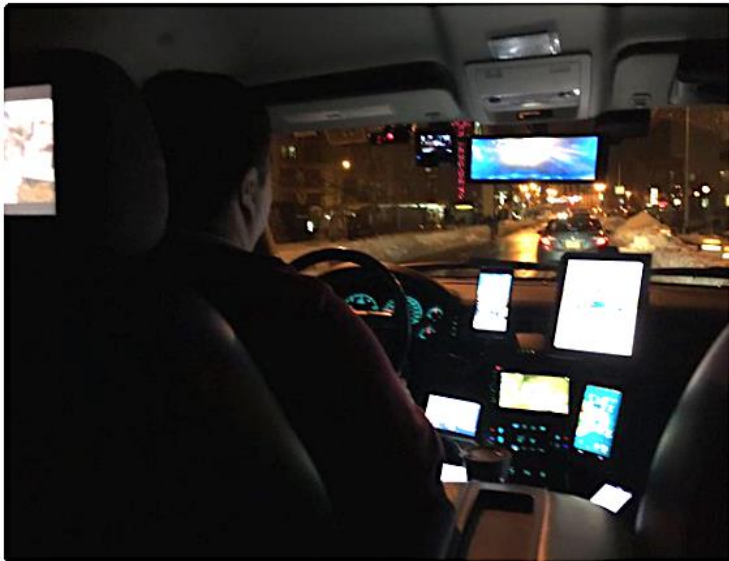
Driver distraction & Technological development



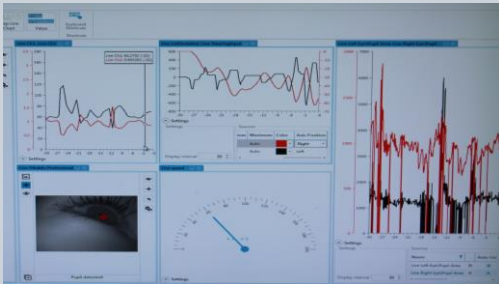

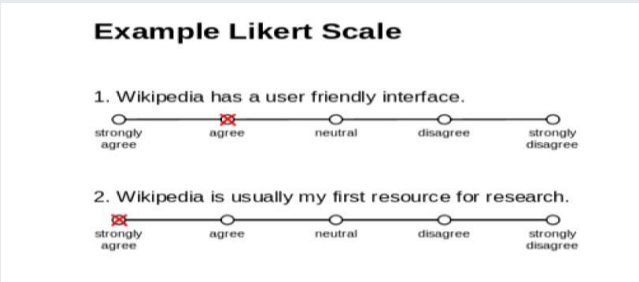
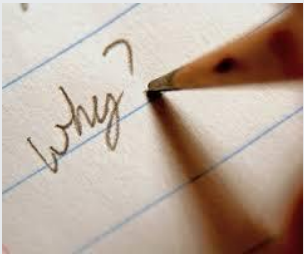
1950's Jaguar interior



2016 Jaguar interior



Current driver distraction research

	Quantitative	Qualitative
Objective	 <p>Reading a text took the drivers eyes away from the road for 4 seconds</p>	 <p><i>"Yes, I read text messages on my phone while driving"</i></p>
Subjective	 <p>On a scale of 1-10, the driver rated reading a text while driving to be a 7 in terms of its distractive effects</p>	 <p><i>"I only read a text while driving if my phone is placed in the phone holder, it is switched on to loud mode and I am driving on a quiet road because it grabs my attention"</i></p>

Semi-structured interviews

- Gaining subjective information from the driver about their self-reported behaviours

Benefits	Limitations
Advanced preparation	Researcher bias
Reliable and comparable data	Social desirability bias
Participant freedom of speech	Must ensure confidentiality
Rich data derived from participants own experiences	Time consuming

Interview study: Methodology

- ~45min interviews with 30 participants. (23hours total)
- Participant Criteria:
 - Hold a full UK driving license for minimum of 1 year
 - Own/have access to their own vehicle
 - Frequent drivers (~3-4 trips per week)
- Confidentiality/Anonymity assured

Interview study: Part 1

- Part 1: Discussion on driver distraction

Q1. *What do you think it means to be distracted?*

Q2. *Do you think being distracted is always a negative thing while driving?*

Q3. *Do you know what the UK law on driver distraction currently states?*

Q4. *Can you describe a time recently where you might have been distracted whilst driving?*

Interview study: Part 2

- **Aim: Understand *what* technology drivers do/do not engage with while driving and their reasoning *why*.**

Interview study: Part 2

Exploring drivers self-reported behaviour

- **Sat-nav**

- Monitor Route
- Enter destination



- **Hands-free**

- Find/Enter number
- Answer call
- Talk via hands-free
- Write/send text message



- **IVIS**

- Change climate controls
- Change song/audio track
- Adjust volume
- Listen to music
- Verbally communicate with in-built system



- **Mobile Phone**

- Monitor navigation app on phone
- Enter destination into navigational app on phone
- Write/Send a text
- Read a text
- Answer a phone call
- Talk on the phone
- Enter/Find a number
- Use voice assistant features
- Take a photo
- Use social media apps
- Check email



- **Other behaviours**

- Drive fatigued
- Talk to a passenger
- Drive at a speed over the speed limit
- Eat/Drink
- **Other...**



Interview study: Part 2



Motorway



A/B Road



Urban Road



Rural Road



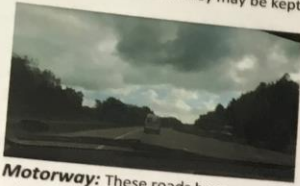
Residential Road



Junction

Road classifications – Definitions and Examples

Below are the different types of roads within the UK. Please read the descriptions as they are required for the following task. They may be kept for reference.



Motorway: These roads have a speed limit of **70mph** (the national limit). They are the major highways which carry a large volume of traffic at great speed. They are specially designed for motor vehicle traffic and do not directly provide access to properties which may border them. They have relatively few places to leave or join. The signs on motorways are blue.

Examples: M27 connecting Bournemouth and Portsmouth. M25: the ring road around London.



Major road (A/B roads): These roads provide transportation links between, and within, major areas. They provide direct roads to areas with a considerable amount of traffic using them. They have a speed limit of **50-60mph** and are made up of dual carriage ways and single carriage ways.

Examples: A27: runs through Hampshire and West Sussex to East Sussex, providing many connections to other roads including the M3, M27 and A3. A3: Connects London to Portsmouth, passing through Hampshire and Surrey. B333: Connecting Gosport to Lee-on-Solent.



Urban road: These roads have a speed limit of **30-40mph** or less. They are located within the boundaries of a built-up urban areas, providing traffic links between cities, towns and villages. They are often named as streets and have exit and entry points specifically sign posted. The roads are usually single-lane and paved.

Examples: Stoneham lane: joins Eastleigh to Junction 5 of the M27. Chestnut Avenue: Around the outside of Eastleigh.



Rural road: These roads are found outside of urban areas, in non-built up areas which have a population of less than 10,000 residents. They have a maximum speed limit of **60mph**. They are used to connect rural areas to the road network. They may not always be paved.

Examples: Found in the countryside outside of Winchester, Kings Somborne and New Alresford.



Residential road: These roads have a maximum speed limit of **20-30mph**. They usually have light traffic and are mainly built up on both sides, with a mixture of residential and local facilities. They are designated lorry routes.

Examples: Bassett Crescent, Upper Shirley, Hill Lane.



Junction: These are points where two or more roads join or intersect which changes the structure of the road at that point. They may have traffic lights which control the flow of traffic, or they may require the driver to monitor the road environment before continuing with their route. Sometimes you are required to stop at the junction for a short period of time, other junctions you can drive straight through.

Examples: Yellow box junctions, cross roads, Y junctions, turning left and turning right.

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Place a number in each box that represents your likelihood to engage with the task while driving within each of the road environments.

Task	Road Type			
	Motorway	Major A/B road	Urban road	Rural road
Change climate controls	5	5	5	5
Change song/radio station on media system	5	4	3	2
Adjust volume	5	5	5	5

Task	Road Type		
	Motorway	Major A/B road	Urban road
Enter destination into mobile navigational aid	5	2	1
Monitor navigational aid on phone	5	5	5
Write/send a text	4	3	2
Read a text	3	3	3
Answer a phone call	5	5	4
Use the phone	5	5	5

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Place a number in each box that represents your likelihood to engage with the task while driving within each of the road environments.

Task	Road Type						
	Motorway	Major A/B road	Urban road	Rural road	Residential road	Drive Through	Junction
Enter/find a number	4	3	2	1	1	1	5
Change song/audio track	5	4	4	4	4	4	4
Use voice assistant features	1	1	1	1	1	1	1
Take a photo	4	2	1	1	1	1	5
Social media apps	1	1	1	1	1	1	3
Check your email	1	1	1	1	1	1	3

Monitor navigational aid on phone	5	5	5	5	5	5	5
Write/send a text	4	3	2	1	1	1	5
Read a text	3	3	3	3	3	3	5
Answer a phone call	5	5	4	5	4	5	5
Use the phone	5	5	5	5	5	5	5

Interview study: Results

Participants

		Age Group			
		18-30	31-49	50-65	Total
Gender	Female	5	5	5	15
	Male	5	5	5	15
	Total	10	10	10	30

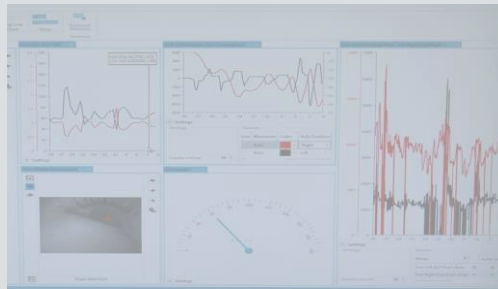
Age

Category	18-30		31-49		50-65	
	Female	Male	Female	Male	Female	Male
Average (yrs)	25.8	25.6	38	35.6	53.6	56.2

Interview Part 2: Results - Subjective/Quantitative

Quantitative

Objective



Reading a text took the drivers eyes away from the road for 4 seconds

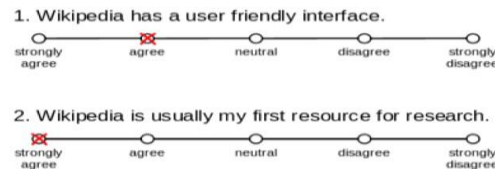
Qualitative



"Yes, I read text messages on my phone while driving"

Subjective

Example Likert Scale

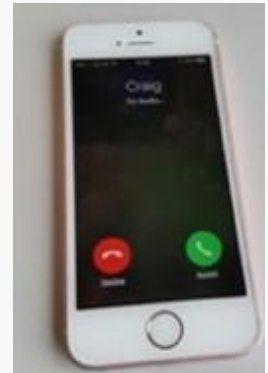


On a scale of 1-10, the driver rated reading a text while driving to be a 7 in terms of its distractive effects



"I only read a text while driving if my phone is placed in the phone holder, it is switched on to loud mode and I am driving on a quiet road because it grabs my attention"




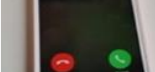
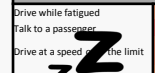
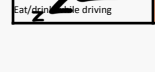
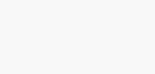
TOTAL	Road Type						
	Motorway	A/B Road	Urban Road	Rural Road	Residential Road	Junction (Drive)	Junction (Stop)
Task							
Navigation system							
Monitor route	3.09	3.31	3.44	3.19	3.19	2.59	3.41
Enter destination	1.69	1.63	1.63	1.50	1.44	1.09	2.28
Hands-free system							
Find number from address book	1.78	1.56	1.50	1.41	1.44	1.16	1.97
Answer a call	3.16	3.09	3.06	2.88	3.06	2.22	3.34
Talk to other	3.28	3.28	3.22	3.03	3.25	2.84	3.34
Write/Send a text	1.22	1.11	1.15	1.04	1.04	1.07	1.37
In-vehicle system							
Change climate control	4.53	4.59	4.53	4.41	4.53	2.84	4.56
Change song/radio station	4.63	4.47	4.25	4.06	4.09	2.59	4.44
Adjust volume	4.66	4.69	4.66	4.63	4.53	3.38	4.72
Listen to music	4.78	4.78	4.78	4.72	4.72	4.56	4.78
Verbally communicate with in-built system	2.69	2.59	2.50	2.44	2.47	1.91	2.78
Mobile phone/Portable device							
Enter destination navigation app	1.78	1.59	1.41	1.34	1.31	1.16	2.31
Monitor navigation app	2.66	2.66	2.78	2.72	2.66	2.28	2.88
Write/send a text	1.50	1.38	1.16	1.09	1.13	1.06	2.03
Read a text	2.19	2.16	2.03	1.84	1.94	1.38	2.91
Answer phone call	2.06	1.84	1.72	1.63	1.66	1.28	1.94
Talk on the phone	1.91	1.69	1.72	1.53	1.63	1.38	1.88
Enter/find a number	1.69	1.56	1.44	1.34	1.50	1.22	2.25
Change song/audio track	1.84	1.75	1.66	1.53	1.53	1.13	1.94
Use voice assist features	1.75	1.69	1.59	1.59	1.59	1.13	1.59
Take a photo	1.19	1.13	1.09	1.09	1.09	1.00	1.41
Use social media apps	1.06	1.09	1.06	1.06	1.06	1.03	1.59
Check your email	1.38	1.38	1.22	1.19	1.16	1.13	1.81
Other Behaviours							
Drive while fatigued	3.56	3.47	3.50	3.19	3.53	3.53	3.53
Talk to a passenger	4.72	4.72	4.59	4.38	4.50	4.06	4.66
Drive at a speed over the limit	3.75	3.47	2.63	2.66	2.13	1.97	1.55
Eat/drink while driving	3.62	3.38	2.76	2.45	2.52	1.83	3.38



Interview Part 2: Results

Age group comparisons


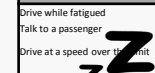
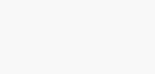
18-30yrs

18-30		Road Type						
Task	Motorway	A/B Road	Urban Road	Rural Road	Road	Residential (Drive)	Junction (Drive)	Junction (Stop)
	Navigation system							
	3.2	3.4	3.4	3.2	3.2	2.7	3.8	
	Hands-free system							
	1.7	1.5	1.8	1.5	1.8	1	2.6	
	In-vehicle system							
	1.7	1.2	1.3	1.1	1.4	1.1	2.3	
	Mobile phone/Portable device							
	4.3	4.2	4	3.6	4.1	3.1	4.4	
	Other Behaviours							
	4.4	4.4	4.1	3.7	4.4	4	4.1	
	Drive while fatigued							
	4.28571429	1.142857143	1.142857143	1.142857143	1.142857143	1.142857143	1.428571429	
	Talk to a passenger							
	4.6	4.7	4.6	4.3	4.8	3.3	4.6	
	Drive at a speed over the limit							
	4.9	4.4	4.3	4.4	4.2	3.3	4.6	
	Eat/drink while driving							
	5	5	4.9	4.8	4.9	4.4	5	
	Navigation system							
	5	5	4.9	4.9	4.9	4.8	4.9	
	Hands-free system							
	3.6	3.3	3.1	2.8	3.1	2.8	3.8	
	In-vehicle system							
	2.4	1.8	1.6	1.5	1.5	1.4	3	
	Mobile phone/Portable device							
	3.5	3.5	3.6	3.6	3.6	3.2	3.5	
	Other Behaviours							
	2.1	1.8	1.3	1.1	1.3	1.1	2.2	
	Drive while fatigued							
	2.9	2.7	2.5	2.4	2.6	1.9	3.2	
	Talk to a passenger							
	2.8	2.6	2.1	2.2	2.3	1.6	2.5	
	Drive at a speed over the limit							
	2.4	2.2	2.1	1.9	2.3	1.6	2.4	
	Eat/drink while driving							
	2.2	1.9	1.7	1.5	1.8	1.4	2.4	
	Navigation system							
	2.3	2	1.9	1.7	1.8	1.4	2.5	
	Hands-free system							
	1.5	1.3	1.4	1.3	1.4	1.2	1.6	
	In-vehicle system							
	1.3	1.1	1	1	1	1	1.6	
	Mobile phone/Portable device							
	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
	Other Behaviours							
	2	1.9	1.5	1.4	1.5	1.4	2.1	
	Drive while fatigued							
	3.9	3.8	3.9	3.4	3.9	3.9	3.9	
	Talk to a passenger							
	4.8	4.8	4.5	4.3	4.5	4.4	4.7	
	Drive at a speed over the limit							
	4.1	3.6	2.4	2.7	2.2	2.3	1.833333333	
	Eat/drink while driving							
	3.75	3.5	2.625	2.375	2.625	2.25	3.875	

31-49yrs

31-49		Road Type						
Task	Motorway	A/B Road	Urban Road	Rural Road	Road	Residential (Drive)	Junction (Drive)	Junction (Stop)
	Navigation system							
	3.1	3.5	3.8	3.3	3.3	2.6	3.2	
	Hands-free system							
	2.3	2.2	2	2	1.6	1.3	3	
	In-vehicle system							
	2.1	2	1.8	1.7	1.7	1.4	2.2	
	Mobile phone/Portable device							
	2.8	2.7	3	2.9	3	2.3	3.4	
	Other Behaviours							
	2.8	2.8	3	2.8	3	2.8	3.5	
	Drive while fatigued							
	1.3	1.2	1.3	1.1	1	1.1	1.7	
	Talk to a passenger							
	4.9	4.9	4.9	4.8	4.8	3	5	
	Drive at a speed over the limit							
	4.8	4.8	4.7	4.1	4.5	2.8	5	
	Eat/drink while driving							
	4.9	4.9	4.9	4.9	4.9	3.3	5	
	Navigation system							
	5	5	5	5	5	4.6	5	
	Hands-free system							
	1.8	1.8	1.8	1.8	1.8	1.2	2.2	
	In-vehicle system							
	2.2	2.2	2.1	2	1.8	1.5	2.9	
	Mobile phone/Portable device							
	2.6	2.6	2.9	2.7	2.7	2.2	3.1	
	Other Behaviours							
	1.4	1.3	1.2	1.2	1.1	1.1	2.5	
	Drive while fatigued							
	2.4	2.5	2.6	2.3	2.3	1.6	4.2	
	Talk to a passenger							
	2.4	1.9	2.2	1.8	1.8	1.1	2.5	
	Drive at a speed over the limit							
	2.3	1.8	2.2	1.8	1.7	1.4	2.4	
	Eat/drink while driving							
	2.3	2.2	2	1.9	2.2	1.6	3.4	
	Navigation system							
	1.9	1.9	1.8	1.9	1.7	1.1	2.1	
	Hands-free system							
	2	2	1.9	1.8	1.8	1.1	1.7	
	In-vehicle system							
	1.3	1.3	1.3	1.3	1.3	1	1.7	
	Mobile phone/Portable device							
	1.1	1.1	1.1	1.1	1.1	1	2.2	
	Other Behaviours							
	1.6	1.6	1.6	1.6	1.4	1.4	2.8	
	Drive while fatigued							
	3.6	3.5	3.5	3.1	3.5	3.5	3.5	
	Talk to a passenger							
	4.9	4.9	4.8	4.4	4.7	4.6	5	
	Drive at a speed over the limit							
	4.4	4.2	2.9	3.6	2.4	2.6	2.166666667	
	Eat/drink while driving							
	3.7	3.5	3.2	2.8	3.1	2.2	3.8	

50-65yrs

50-65		Road Type						
Task	Motorway	A/B Road	Urban Road	Rural Road	Road	Residential (Drive)	Junction (Drive)	Junction (Stop)
	Navigation system							
	3.4	3.5	3.5	3.4	3.4	2.8	3.6	
	Hands-free system							
	1.2	1.3	1.2	1.1	1	1	1.5	
	In-vehicle system							
	1.6	1.5	1.4	1.4	1.2	1	1.6	
	Mobile phone/Portable device							
	2.1	2	1.9	2	1.9	1.4	2.1	
	Other Behaviours							
	2.3	2.2	2.2	2.3	2	1.9	2.2	
	Drive while fatigued							
	1	1	1	1	1	1	1	
	Talk to a passenger							
	4.4	4.4	4.2	4.2	4.1	2.9	4.3	
	Drive at a speed over the limit							
	4.5	4.4	3.7	3.6	3.5	2.3	3.9	
	Eat/drink while driving							
	4.5	4.5	4.4	4.4	4	3.2	4.4	
	Navigation system							
	4.6	4.6	4.6	4.6	4.5	4.6	4.6	
	Hands-free system							
	2.1	2.1	1.9	2	1.8	1.7	2	
	In-vehicle system							
	1	1	1	1	1.1	1	1.3	
	Mobile phone/Portable device							
	1.9	1.9	1.8	1.8	1.6	1.4	1.8	
	Other Behaviours							
	1	1	1	1	1	1	1.2	
	Drive while fatigued							
	1.6	1.5	1.3	1.3	1.3	1.1	1.5	
	Talk to a passenger							
	1.3	1.3	1.2	1.2	1.2	1.2	1.3	
	Drive at a speed over the limit							
	1.3	1.3	1.2	1.2	1.2	1.2	1.3	
	Eat/drink while driving							
	1	1	1	1	1	1	1.1	
	Navigation system							
	1.2	1.2	1.1	1.1	1.1	1	1.1	
	Hands-free system							
	1.2	1.2	1.1	1.1	1.2	1.1	1.2	
	In-vehicle system							
	1	1	1	1	1	1	1	
	Mobile phone/Portable device							
	1	1	1	1	1	1	1	
	Other Behaviours							
	1	1	1	1	1	1	1	
	Drive while fatigued							
	3.3	3.3	3.2	3.2	3.2	3.2	3.2	
	Talk to a passenger							
	4.6	4.6	4.5	4.4	4.3	3.6	4.2	
	Drive at a speed over the limit							
	3.1	2.8	2.6	2.2	1.7	1.2	4	
	Eat/drink while driving							
	3.555555556	3.333333333	2.555555556	2.333333333	2.111111111	1.555555556	2.555555556	

Interview Part 2: Results

Age group x Gender comparisons

18-30

31-49

50-65

Female

Task	Road Type						
	Motorway	A/B Road	Urban Road	Rural Road	Residential Road	Junction (Drive)	Junction (Stop)
Navigation system							
Monitor route	3.00	3.00	2.50	2.50	2.50	2.00	3.00
Enter destination	2.50	2.00	1.75	1.50	1.75	1.00	2.00
Hands-free system							
Find number from address book	2.00	1.25	1.50	1.25	1.75	1.00	2.00
Answer a call	4.75	4.50	4.25	3.50	4.50	3.00	5.00
Talk to other	5.00	5.00	4.50	3.50	4.75	3.00	4.25
Write/Send a text	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-vehicle system							
Change climate control	4.75	4.75	4.50	4.00	4.75	1.75	4.25
Change song/radio station	5.00	4.00	4.75	4.50	4.75	2.25	4.25
Adjust volume	5.00	5.00	5.00	4.50	5.00	3.25	5.00
Listen to music	5.00	5.00	5.00	4.50	4.75	4.75	5.00
Verbally communicate with in-built system	4.00	3.75	4.00	3.75	4.00	2.50	4.00
Mobile phone/Portable device							
Enter destination navigation app	2.75	2.00	1.50	1.00	1.25	1.00	3.75
Monitor navigation app	5.00	5.00	5.00	5.00	5.00	4.00	4.00
Write/send a text	2.00	1.50	1.25	1.00	1.25	1.00	2.75
Read a text	3.25	2.75	3.00	2.50	3.00	1.00	3.50
Answer phone call	3.00	2.50	2.00	1.75	2.00	1.00	2.00
Talk on the phone	2.00	1.50	1.75	1.25	1.75	1.00	1.75
Enter/find a number	2.00	1.50	1.50	1.25	1.50	1.00	2.75
Change song/audio track	3.25	2.75	2.75	2.00	2.50	1.00	3.25
Use voice assist features	2.75	2.25	2.50	2.25	2.50	1.00	2.75
Take a photo	1.00	1.00	1.00	1.00	1.00	1.00	1.50
Use social media apps	1.25	1.25	1.25	1.25	1.25	1.25	2.00
Check your email	2.00	1.75	1.25	1.00	1.00	1.00	1.50
Other Behaviours							
Drive while fatigued	4.25	4.00	4.00	3.75	4.00	4.00	4.00
Talk to a passenger	5.00	5.00	5.00	4.50	5.00	4.50	5.00
Drive at a speed over the limit	4.25	3.75	2.75	3.00	2.25	2.25	3.00
Eat/drink while driving	4.33	4.00	3.00	2.33	2.67	1.67	3.67

Task	Road Type						
	Motorway	A/B Road	Urban Road	Rural Road	Residential Road	Junction (Drive)	Junction (Stop)
Navigation system							
Monitor route	3.20	3.80	4.20	3.60	3.60	3.60	3.20
Enter destination	2.00	2.00	1.80	2.00	1.40	1.40	2.80
Hands-free system							
Find number from address book	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Answer a call	2.60	2.60	3.20	3.20	3.40	2.40	3.40
Talk to other	2.60	2.40	3.00	3.00	3.20	2.80	3.40
Write/Send a text	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-vehicle system							
Change climate control	4.80	4.80	4.80	4.80	4.80	2.80	5.00
Change song/radio station	4.60	4.60	4.60	4.20	4.40	3.00	5.00
Adjust volume	4.80	4.80	4.80	4.80	4.80	3.00	5.00
Listen to music	5.00	5.00	5.00	5.00	5.00	4.20	5.00
Verbally communicate with in-built system	1.80	1.80	1.80	1.80	1.80	1.20	2.60
Mobile phone/Portable device							
Enter destination navigation app	1.60	1.60	1.60	1.60	1.60	1.00	2.40
Monitor navigation app	2.40	2.40	2.60	2.40	2.40	2.00	2.80
Write/send a text	1.00	1.00	1.00	1.20	1.00	1.00	1.80
Read a text	1.40	1.80	2.20	1.60	1.60	1.00	4.00
Answer phone call	1.80	1.00	1.80	1.00	1.00	1.00	1.00
Talk on the phone	1.80	1.00	1.80	1.00	1.00	1.00	1.00
Enter/find a number	1.80	1.80	1.60	1.80	2.00	1.60	2.80
Change song/audio track	1.40	1.40	1.40	1.60	1.60	1.00	1.60
Use voice assist features	1.80	1.80	1.60	1.80	1.40	1.00	1.80
Take a photo	1.60	1.60	1.60	1.60	1.60	1.00	1.20
Use social media apps	1.00	1.00	1.00	1.00	1.00	1.00	2.00
Other Behaviours							
Check your email	1.00	1.00	1.00	1.00	1.00	1.00	2.00
Drive while fatigued	3.60	3.40	3.40	3.40	3.40	3.40	3.40
Talk to a passenger	4.80	4.80	4.60	4.20	4.80	4.40	5.00
Drive at a speed over the limit	4.40	4.20	3.20	3.60	2.60	2.60	2.33
Eat/drink while driving	3.40	3.20	3.00	2.80	2.80	2.20	3.80

Task	Road Type						
	Motorway	A/B Road	Urban Road	Rural Road	Residential Road	Junction (Drive)	Junction (Stop)
Navigation system							
Monitor route	3.00	3.00	2.80	2.60	2.60	2.80	3.20
Enter destination	1.00	1.20	1.20	1.00	1.00	1.00	1.00
Hands-free system							
Find number from address book	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Answer a call	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Talk to other	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Write/Send a text	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-vehicle system							
Change climate control	3.80	3.80	3.60	3.60	3.60	2.80	3.60
Change song/radio station	4.40	4.20	3.80	3.60	3.40	2.60	3.40
Adjust volume	4.00	4.00	4.00	4.00	3.80	3.20	3.80
Listen to music	4.80	4.80	4.80	4.80	4.80	4.80	4.80
Verbally communicate with in-built system	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Mobile phone/Portable device							
Enter destination navigation app	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Monitor navigation app	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Write/send a text	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Read a text	1.40	1.20	1.00	1.00	1.00	1.00	1.00
Answer phone call	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Talk on the phone	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Enter/find a number	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Change song/audio track	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Use voice assist features	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Take a photo	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Use social media apps	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Other Behaviours							
Check your email	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Drive while fatigued	3.40	3.40	3.20	3.20	3.20	3.20	3.20
Talk to a passenger	4.20	4.20	4.00	3.80	3.80	3.40	3.40
Drive at a speed over the limit	2.20	2.00	2.00	1.60	1.00	1.20	1.00
Eat/drink while driving	3.80	3.60	3.20	2.40	2.40	2.00	2.40

Male

Task	Road Type						
	Motorway	A/B Road	Urban Road	Rural Road	Residential Road	Junction (Drive)	Junction (Stop)
Navigation system							
Monitor route	3.20	3.60	4.20	3.80	4.00	3.40	4.80
Enter destination	1.20	1.20	2.00	1.60	2.00	1.00	3.40
Hands-free system							
Find number from address book	1.60	1.20	1.20	1.00	1.20	1.20	2.80
Answer a call	4.80	4.80	4.40	4.00	4.40	3.00	4.80
Talk to other	4.80	4.80	4.40	4.40	4.80	4.80	4.80
Write/Send a text	2.00	1.33	1.33	1.00	1.33	1.33	2.00
In-vehicle system							
Change climate control	5.00	5.00	4.80	4.60	4.80	3.80	5.00
Change song/radio station	4.80	4.60	3.80	4.20	3.60	3.00	4.80
Adjust volume	5.00	5.00	4.80	5.00	4.80	4.40	5.00
Listen to music	5.00	5.00	4.80	4.80	4.80	4.80	4.80
Verbally communicate with in-built system	4.20	3.80	3.20	3.20	3.20	3.60	4.40
Mobile phone/Portable device							
Enter destination navigation app	2.00	1.40	1.00	1.20	1.00	1.00	2.80
Monitor navigation app	2.80	2.80	3.00	3.00	3.00	3.00	3.60
Write/send a text	2.40	2.20	1.40	1.20	1.40	1.20	2.60
Read a text	2.60	2.60	2.00	2.00	2.20	2.00	3.40
Answer phone call	2.80	2.80	2.00	2.40	2.40	2.20	2.60
Talk on the phone	2.80	2.80	2.20	2.20	2.60	2.20	2.60
Enter/find a number	2.00	1.80	1.40	1.20	1.40	1.20	2.60
Change song/audio track	2.20	2.00	1.80	1.60	1.80	1.60	2.80
Use voice assist features	1.40	1.40	1.40	1.40	1.40	1.40	1.60
Take a photo	1.60	1.20	1.00	1.00	1.00	1.00	1.80
Use social media apps	1.00	1.00	1.00	1.00	1.00	1.00	1.60
Check your email	1.40	1.40	1.00	1.00	1.20	1.00	2.20
Other Behaviours							
Drive while fatigued	4.20	4.20	4.40	3.60	4.40	4.40	4.40
Talk to a passenger	5.00	5.00	4.40	4.40	4.40	4.80	5.00
Drive at a speed over the limit	4.00	3.60	2.20	2.20	2.20	2.20	1.00
Eat/drink while driving	4.00	3.50	2.25	2.00	2.25	2.00	4.75

Task	Road Type						
	Motorway	A/B Road	Urban Road	Rural Road	Residential Road	Junction (Drive)	Junction (Stop)
Navigation system							
Monitor route	3.00	3.20	3.40	3.00	3.00	1.60	3.20
Enter destination	2.60	2.40	2.20	2.00	1.80	1.20	3.20
Hands-free system							
Find number from address book	2.60	2.40	2.00	1.80	1.80	1.20	2.80
Answer a call	3.00	2.80	2.80	2.60	2.60	2.20	3.40
Talk to other	3.00	3.20	3.00	2.60	2.80	2.80	3.60
Write/Send a text	1.60	1.40	1.60	1.20	1.00	1.20	2.40
In-vehicle system							
Change climate control	5.00	5.00	5.00	4.80	4.80	3.20	5.00
Change song/radio station	5.00	5.00	4.80	4.00	4.60	2.60	5.00
Adjust volume	5.00	5.00	5.00	5.00	5.00	3.60	5.00
Listen to music	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Verbally communicate with in-built system	1.80	1.80	1.80	1.80	1.80	1.20	1.80
Mobile phone/Portable device							
Enter destination navigation app	2.80	2.80	2.60	2.40	2.00	2.00	3.40
Monitor navigation app	2.80	2.80	3.20	3.00	3.00	2.40	3.40
Write/send a text	1.80	1.60	1.40	1.20	1.20	1.20	3.20
Read a text	3.40	3.20	3.00	3.00	3.00	2.20	4.40
Answer phone call	3.00	2.80	2.60	2.60	2.60	1.20	4.40
Talk on the phone	2.80	2.60	2.60</				

Interview study: Results

- Table with other tasks

Category	Other distracting tasks	Frequency
Non-driving related task (do not require taking hands off the wheel)	Sing	4
	Mental games	1
	Dance	1
Non-driving related tasks (do require taking hands off of the wheel)	Attend to child	4
	Take coat off	1
	Smoking	1
	Putting on glasses	1
	Reading	1
	Personal Grooming	1
Driving related tasks	Car warning lights	2
	Demisting windscreen	1
	Avoiding sun glare	1
	Monitoring road surface	1
Other Technology	Bluetooth headset	1
	Smart Watch	1
Feeling	Lateness	1

Interview Part 2: Results-Subjective/Qualitative

Quantitative

Objective



Reading a text took the drivers eyes away from the road for 4 seconds

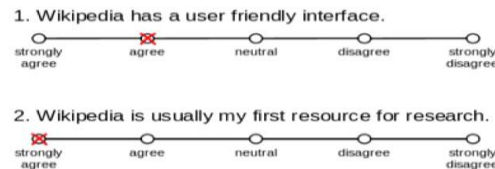
Qualitative



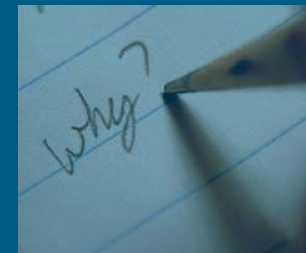
"Yes, I read text messages on my phone while driving"

Subjective

Example Likert Scale



On a scale of 1-10, the driver rated reading a text while driving to be a 7 in terms of its distractive effects



"I only read a text while driving if my phone is placed in the phone holder, it is switched on to loud mode and I am driving on a quiet road because it grabs my attention"

Interview Part 2: Results

Age group comparisons – mobile phone

■ 18-30

“Okay, reading a text. Yes, I would read a text. It just pops up on your phone. It’s impossible not to really.”

“Yeah. So, like I would still be looking at the road and then I’d type like a word or two and see how close I get it.”

“Reading a text”, you see I would read a text just because of the nature of the fact that it flashes up on your phone.”

“Yeah, I think. Well, if it’s a short text. I wouldn’t write a big old paragraph but just like will be home at text.”

■ 50-65

“Send a text on a hand held device”? I can’t do that when I’m stood still in a car park, let alone driving along, so no, no, no, no”

“Take a photo on a hand held device”, well I have problems doing that in the front room of my house

Interviewer: “Do you listen to music on your phone?”

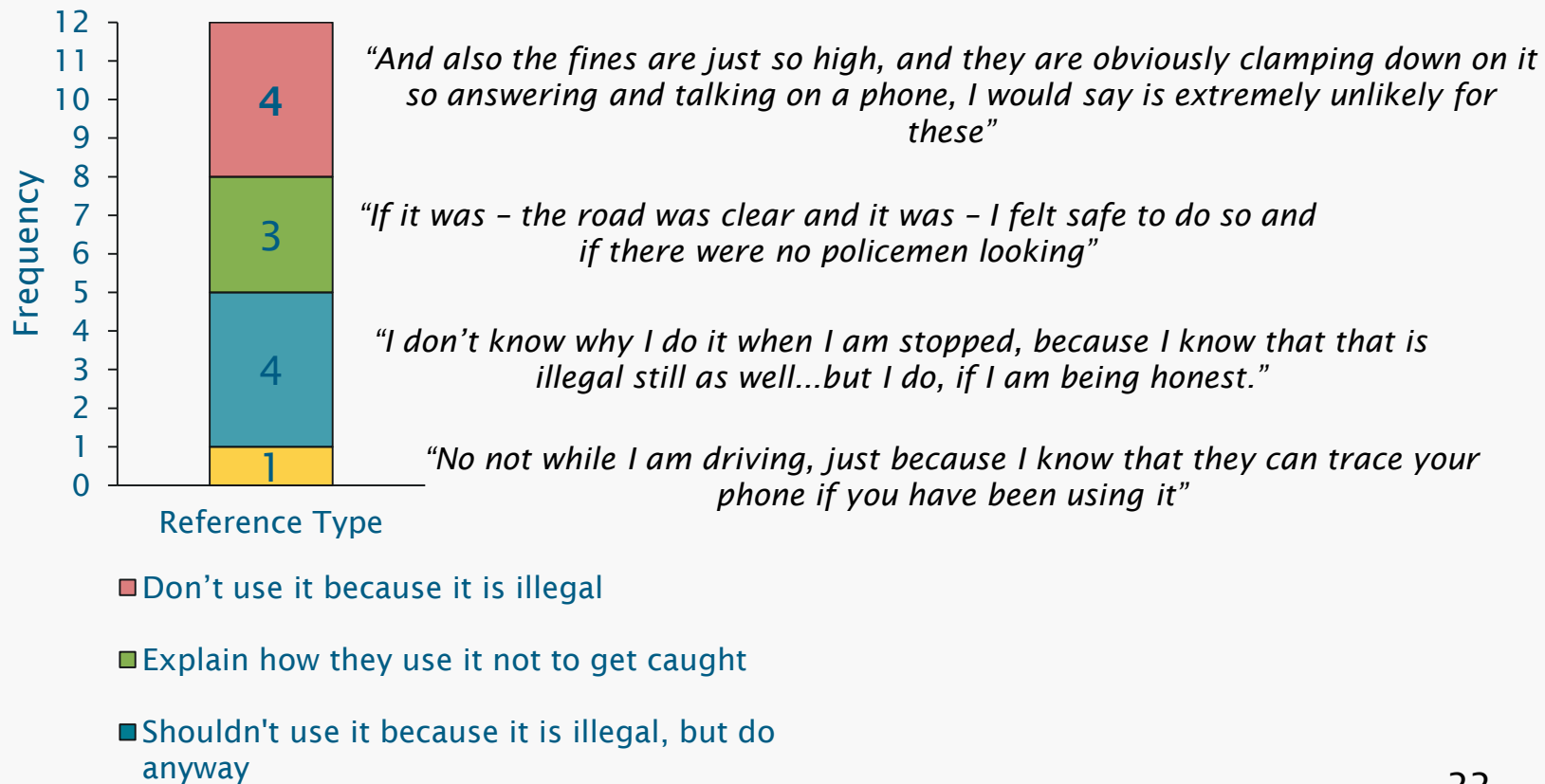
Respondent: “No because I have got no music on my phone. My phone is a phone. It might be a smart phone, but it is a phone. I don’t even use it for anything else anywhere so.”

”The phone is for me, not them. It is having just a bit of attitude! If it kept on ringing, I might stop and find out, but I never, never, never.”

“Take photos, what whilst driving? No...you are supposed to be concentrating on you’re driving not playing!”

Interview Part 2: Results

References to legislation



Future work

- Detailed analysis of road type

“Because I’ve stopped, I’m not moving my car so I can’t hurt anyone or myself.”

“Residential I would probably be quite likely to do that, again you are crawling along and that is often when you need the sat nav at the end of the journey”

- Explore the impact of the location of technological devices

“I probably would read a text if it came through, I would probably glance to see who it is and if I think it is important then I might do that”

“Not while I’m driving, no. I literally just use the satnav so I would never- it either sits in my cup holder or in my bag. Like I don’t really- I can’t think of any time that I’d like look at it”

- Explore the impact of circumstantial factor (independent of road type)

“If it was urgent and I was waiting for it, and if it was my daughter or my son.”

“Particular times you might be expecting a message, or you might need to know about something so it is like actually that would make me want to do it. Otherwise if it’s like oh I just had a message, I’m not like I desperately need to read that.”

Interview Study: Limitations

- Drivers reported wanting a zero on the scale: ‘Never’

“I don’t know why you have got a 1, there should be zero there somewhere because that would definitely be extremely unlikely that I would do a text, especially whilst driving.”

- Personal interpretation

“Is this question really about would I choose to listen to music?”

“Use social media apps. In this bit here I am little bit confused because ... shall I talk about things that have happened recently, such as last year or ...?”

- Social desirability bias

“Take a photo. Yes, I’ve done it. Oh God, if I say I might go to jail!”

Conclusions

- Subjective research can capture *what* technologies drivers use when driving but also *why*.
- Individual differences influence how likely drivers are to engage with different in-vehicle technologies.
- The law does not seem to be playing a large role in influencing drivers intentions towards distracting behaviour.
- Future research into driver distraction should look at utilising subjective methods alongside objective methods

Thank-you for listening

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